

THE INDEPENDENT DEVELOPMENT OF MID TONE IN SUMA¹

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0. *Introduction.* Tone change is not arbitrary (cf. Hyman 1978) but its motivation has not been clearly addressed. Motivations for tone change usually focus on phonetic explanations, which are necessarily limited. They account for the plausibility of a change, but they do not answer the question of why a new tone contrast developed.

One possible explanation for the appearance of new tone contrasts is that the burden of information carried by tones can be so great that tone split occurs. Henderson (1982) calls this sort of phenomenon 'avoidance of overlap'. Monino (1981) speculates that in the protolanguage of the Gbaya languages spoken in the Central African Republic and Cameroun the use of tone both lexically and grammatically led to a situation in which meaning could be obscured because the tone patterns could be interpreted in different ways. In other words, two phonological tones were too few to clearly express the information they encoded.

The Suma language is one of the Gbaya languages that was not included in Monino's comparative study. It differs from the other 3-tone Gbaya languages in that its mid tone developed from the tone sequence LH rather than from H. This paper will compare the tone changes that have led to the present tone system in Suma with those of

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the 21 related Gbaya languages presented in Monino (1981) in order to establish the independence of the tone-splitting in Suma from that in other 3-tone Gbaya languages. In so doing, it will classify Suma with respect to the other Gbaya languages and fill in an important gap in Monino's comparative work. Furthermore, the question of why Suma developed a 3rd tone will be considered. Whether the motivation was internal or external will be addressed by examining the sorts of evidence that bear on borrowing and internal pressure for change. It will be argued that some internal pressure existed within the protolanguage which can best be explained in terms of an overload of the tonal system.

1. *Suma's Tone System.* Suma is a 3-tone Niger-Congo language spoken in the northwestern part of the Central African Republic. Three phonological tones form lexical contrasts in words like the following:

- | | | |
|-----|------|-----------------------------|
| (1) | kùtù | 'scabies of dogs & goats' |
| | kūrū | 'fog' |
| | kútú | 'certain tree - Papilionia' |

The three tones are also used morphologically to contrast different tenses in verbs.

- | | | | | |
|-----|------|----------------------|------|------------------|
| (2) | kìrì | '(to/will) look for' | fòk | '(to/will) flow' |
| | kirā | '(has) looked for' | fōkā | '(has) flowed' |
| | kiri | 'looks for' | fók | 'flows' |

More information on the 3-tone system can be found in Bradshaw (1995) from which the data in (1) and (2) is drawn.

2. *The Gbaya Languages.* Suma is a member of the group of Gbaya languages which are classified by Greenberg (1966: 9) as group 1 of the Eastern branch of the Adamawa-Eastern subfamily of the Niger-Congo family. They are identified by Samarin (1971) as group 1 of the Ubangi branch of the Adamawa-Ubangi subfamily. The Gbaya languages are spoken in the Central African Republic, Zaire and Cameroun and have been estimated to have around 1,200,000 speakers (Boyd 1989:192).

Monino (1981) further subdivides the Gbaya languages into 4 groups or zones: Central, Eastern, Northwest and Southwest. All of the groups except the last are characterized by 2 phonological tones--at least in Monino's study.

(3) Other Gbaya languages (Monino, 1981)

Central Group (2 tone)

Gbaya bokoto
Gbaya bozom

Gbeya
Gbanu

Eastern Group (3 tone)

ʔali	ngbaka-manza
manza	bofi

Northwest Group (2 tone)

Gbaya kara ɓodoe
Gbaya kara ɓokpan
Gbaya kara ɓonina
Gbaya kara ɓugui
Gbaya kara ɓoya
Gbaya kara yaayuwée
Gbaya lai

Southwest Group (2 tone)

Gbaya ɓiyanda
Gbaya toongo
Gbaya ɓuli
Gbaya mbodomo
Bangando ngombe

The relationship between the different Gbaya languages seems to be very close, to the extent that they might be considered separate dialects rather than separate languages. Samarin (1966: 1-2) has described this relationship as follows:

"Linguistically we are dealing with a more or less homogeneous unit, on the one hand, drastically differentiated at the extremes, where dialects are mutually unintelligible, but, on the other hand, only slightly, and sometimes erratically, differentiated at contiguous geographical points."

The comparative data also provides evidence of the close relationship between these languages. Words compared from the 22 languages (Monino's 21 and Suma) show in most cases a transparent connection with minimal differences. For example, the word for mouth is either /nú/ or /nū/ in all 22 languages. In the other examples that follow, all 22 languages are accounted for.

- | | | |
|-----|-----------|------------------------------|
| (4) | mouth: | nú, nū |
| | pot: | kpánà, kpāná(1) |
| | hoe: | wàrà, wālà |
| | tortoise: | tānà, tǎnǎ |
| | work: | tòm, tò |
| | rain: | kórò, kóró(1), kǒró(1), kólò |

Naturally, some of the words that have been compared are not found in all 22 languages, but the tokens that are found demonstrate an equivalent degree of similarity. Moreover, there is a large shared vocabulary among these languages.

3. *Monino's Comparative Study.* The historical developments within the Gbaya group have been dealt with only by Monino (1981, 1988, appendix to dissertation). As noted above, Suma is not included in his study. He takes the position that proto-Gbaya was a 2-tone language. Although he doesn't provide explicit arguments for this position, it seems to be based on the fact that the majority of the Gbaya languages have 2 phonological tones. Sixteen of the 21 languages he compares have 2-tone systems.

Monino also includes information about the 2-tone Gbanu language that provides a possible phonetic basis for the change from a 2-tone to a 3-tone system. In Gbanu, a word with a LH tone pattern is pronounced with a M tone after a word with a final H tone. In other words, LH is realized as M after a H in Gbanu. Taking together the phonetic justification for a change from 2 to 3 tones in the language group and the number of languages in the group that have 2 rather than 3 tones, there is justification for Monino's conclusion that proto-Gbaya was a 2-tone language.

Monino classifies the 5 three-tone languages as forming a separate group, the Eastern group, and his reason for doing so seems to be tonal. In fact, 4 of these 5 languages have virtually identical tone systems. It is questionable whether similarity in tone systems is enough to establish a genetic relationship. However, I will show that some segmental evidence supports this subgrouping.

Monino suggests that the development of the 3rd tone in these languages was due to an overload on the tone system, as mentioned above. This idea is intuitively satisfying but Monino provides little evidence to support it. Evidence from Suma, however, can provide some support for such a hypothesis, as I will show in section 8.

4. *Lexical Tone Changes: Suma vs. the Eastern Group.* The lexical tone changes in Suma differ from those in the other 3-tone Gbaya languages which make up the Eastern group. Where the Eastern group have M, Suma has H like the 2-tone languages².

(5)	Suma	3-tone	2-tone
cane rat	bíá	biā	bíá
mouth	nú	nū	nú
oil	nó	nō	nó
firewood	gúá	gūā	gúá

A comparison of Suma to the other Gbaya languages reveals two lexical tone changes. The important change for the purpose of the present study is the correspondence between LH in the two-tone languages and M in Suma. The other 3-tone languages have LM corresponding to LH, as expected from the postulated tone change whereby H became M in the Eastern group.

(6)	Suma	3-tone	2-tone
hippo	ngūbū	ngùbū	ngùbú
fog	kūtū	kūtū	kútú
liquor	dā̄	dā̄, dākā̄	dā̄, dōkō
side dish	kpōō	kpōō	kpōó
coldness	gēē	gēē	gēé

² Underlined vowels are nasalized.

(10) Associative Construction in Suma (3-tone)

H	nú	nú gò	'panther's mouth'
L	bèrè	bèrè bágarà	'cow's teat'
LH	běy	běy àlà	'person of suffering'
HL	kpánà	kpánà gèdà	'pot of manioc'
M	dǒǒ	dǒǒ mbúru	'palm wine'

In the Eastern group, the same tone alternations are found as well as alternations in nouns with M or LM tone patterns. These become H and LH respectively.

(11) Eastern group: ali (3-tone)

H	kpóm	túlú kpóm kè	'this one item of clothing'
L	zù	zù sàdì	'animal's head'
LM	ndàrà	ndàrà yèrè	'buffalo skin'
HL	kúli	kúli kòrà	'chicken egg'
M	nú	nú sàdì	'animal's mouth'

In the 2-tone languages, all nouns in the relevant environment alternate tonally except those with a H tone pattern. L nouns become H or LH, depending on their mora count; LH nouns become L; and HL nouns become H.

(12) Gbaya kara 6odoe (2-tone)

H	nú	nú bàn	'mouth of a red monkey'
L	zù	zù gò	'panther's head'
	fùù	fùù gèdà	'manioc flour'
LH	kòtó	kòtó sámbí	'sheep skin'
HL	kúi	kúi kòrà	'chicken egg'

The conditions on the tone alternations are more restrictive in the case of the 2-tone languages than in the 3-tone languages, including Suma. These restrictions will be described briefly in section 8. The similarities and differences in the tone alternations can be seen in (13).

(13) Associative Construction Tone Alternations

2-tone	3-tone	Suma
H = H	H = H	H = H
L → H, LH	L → M	L → M
LH → L	LM → LH	LH = LH
HL → H	HL → H	HL → H
	M → H	M = M

6. *Segmental Evidence.* The similarities in the grammatical tones of Suma and the Eastern group might lead to the conclusion that the development of a 3rd tone in Suma

was an innovation shared with the Eastern group. Segmental evidence points in the opposite direction. Segmental correspondences indicate that Suma should be grouped together with the 2-tone Central languages, Gbeya, Gbaya ɓozom and Gbaya ɓokota and separate from the 3-tone Eastern languages. The significant segmental correspondences are y/r/l/ reconstructed as *j; nz/z reconstructed as *nz; and the word-final r/v correspondence reconstructed as *r.

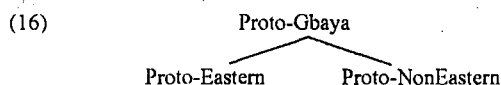
The nz/z correspondence separates Suma from the other 3-tone languages. This suggests that proto-Gbaya split originally into 2 groups, proto-Eastern Gbaya and proto-NonEastern Gbaya, in which proto-NonEastern Gbaya was characterized by a segmental change: *nz > z. Suma originates from the nonEastern group which is characterized by 2 rather than 3 tones.

(14)		3-tone	2-tone	Suma
	outdoors	nza, nzan	zan	zan
	balaphone	nzaŋa	zaŋa	zaŋa
	suck	nzɔɓi	zɔɓi, zɔ'mi	zɔ'mi
	newborn	nzo, nzodɪ	mbo-zo, mbo-zodɪ	zɔ-bem

The nz/z correspondence is reconstructed as *nz rather than *z because of the presence of a z/z correspondence, as shown in (15).

(15)		3-tone	2-tone	Suma
	belly	zaŋ, za	zaŋ, za	zaŋ
	top	zu	zu	zu
	grass	zɔ	zɔ	zɔ
	young woman	zoŋa	zoŋa	zoŋa

Thus there is some evidence for an initial language division.

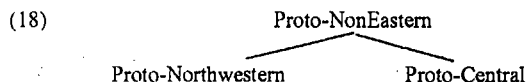


The y/r/l/ correspondence places Suma with the 2-tone Central languages including Gbeya, Gbaya ɓozom and Gbaya ɓokota.

(17) y/r/l/ correspondence in NonEastern subdivision

	NW	Central (& Suma)	Eastern (3-tone)
iron	boyo	boro	boɓo, boɓo
water	yi	ri	li, li
dog	toyo	toro	toɓo, toɓo, to
fruit	waya	wara	wala, wala

This is reconstructed as *ɪ because there are separate correspondence sets for [ɪ], [r] and [y]. This correspondence provides evidence of a further division of the nonEastern group of Gbaya languages into the Northwestern and Central groups. Suma falls within the Central group.

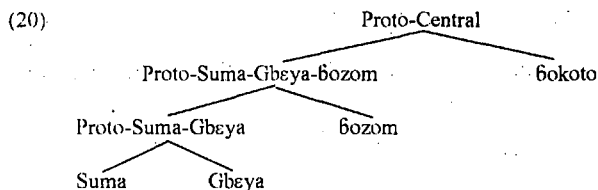


The word-final correspondence r/V serves to subgroup Suma within the Central languages. In Suma, Gbeya and Gbaya 6ozom, final /r/ was lost resulting in vowel lengthening in nouns. In Suma and Gbeya, this phenomenon generalized to include all words.

(19)

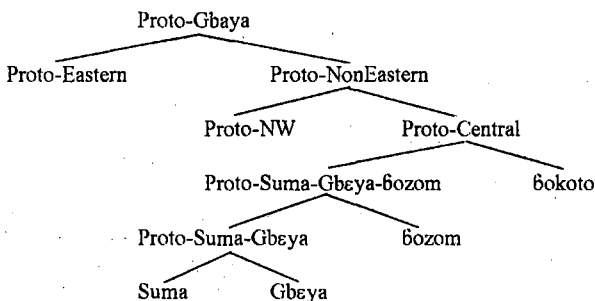
		Suma	Gbeya	6ozom	6okoto
NOUNS:	cord	pɛɛ	pɛɛ	pɛɛ	pɛr
	back	kɔɔ	kɔɔ	kɔɔ	---
	rainy				
	season	'maa	'maa	'maa	6ar
	way	dɔŋ-waa	waa	ri-waa	war
VERBS:	attach	hɛɛ	hɛɛ	her	her
	hit	mbeɛ	mbeɛ	mber	mber
	count	tɔɔ	tɔɔ	tɔri	tɔr
	stand	kuu	kuu	kur	kur
	push	?ii	?ii	?ir	?ir
	twist				
	cloth	'maa	'maa	'mar	---

Thus, a further subdivision is suggested within the Central Group such that Proto-Central divided into Gbaya 6okoto and Proto-Suma-Gbeya-6ozom; and the latter further divided into Gbaya 6ozom and Proto-Suma-Gbeya.



The preceding and other segmental evidence clearly places Suma within the Central group of languages historically. Since Suma groups with other 2-tone languages, this is evidence that the 3-tone languages branched off before a 3rd tone developed in Suma.

(21)



7. *Tonal Evidence vs. Segmental Evidence.* If the segmental evidence suggests independent development and the tone evidence suggests common development, which should be given more weight? Segmental evidence is more reliably established as an indicator of relatedness. Moreover, in the case of Suma, the tonal evidence is less straightforward than the segmental evidence and the tone similarities can be explained in other ways.

The tonal evidence points in different directions depending on whether lexical tones or grammatical tones are compared. The differences in lexical tones between Suma and the Eastern group suggest an independent development of the 3rd tone. The grammatical tones suggest the opposite. But even if the grammatical tones are considered alone, there are reasons to downplay their significance as evidence for tone change. Considering first the associative construction, the grammatical tones are similar for Suma and the Eastern languages, but they are also similar for the entire group of Gbaya languages. Although the similarities are more pronounced between Suma and the Eastern group, the similarity generally reflects the similarity of the Gbaya group as a whole. Since these similarities involve raising effects caused by a morphological floating tone or tone feature, similar effects can be expected in closely related 3-tone languages regardless of whether the 3rd tone develops independently in 2 groups or not.

The grammatical tones on verbs, while virtually identical for Suma and the Eastern group, also involve floating tones, which renders the similarities less convincing as evidence of common development. These similarities can be plausibly explained within the hypothesis that Suma's 3rd tone was an independent innovation. The inverse is not true for the segmental evidence.

The grammatical tones in the imperfective are the same for all the Gbaya languages, ignoring 6ofi. No change occurred in this tone morpheme. The tones of the perfective, however, show a similarity for Suma and the Eastern group that diverges from the 2-tone languages and, presumably, the protolanguage. As noted above, Suma and the Eastern group, excluding 6ofi, have a M tone pattern on perfective verbs; 6ofi has a LM pattern; and the 2-tone languages have a LH tone pattern.

(22) Verb Similarities

	Imperf.	Perf.
2 tones (& proto-Gbaya):	H	LH
Suma:	H	M
3-tones:	H	M
6ofi:	MH	LM

These facts can be accounted for in terms of changes to the tonal morpheme, which is taken to be LH in the protolanguage. In Suma, as expected, this LH morpheme became M. In 6ofi, as expected, the H portion of this LH morpheme became M, resulting in a LM morpheme. In the other 3-tone languages of the Eastern group, it is most probable that there was a stage in which the perfective morpheme was also LM. Subsequently the L portion of the tone pattern could have been reanalyzed as a default tone, with the perfective morpheme being reanalyzed as a M tone. Eventually, the M tone would have spread to all tone bearing units on the verb in perfective tense. While I have no evidence that L is a default tone in these languages, L does appear to be a default tone in Suma (Bradshaw, 1995) which adds credibility to this kind of explanation.

An attempt to weigh the tonal and segmental evidence pertaining to the issue of whether Suma's 3rd tone was an independent development leads to the conclusion that the segmental evidence is stronger than the tonal evidence. Thus, the 3rd tone in Suma must have developed independently.

8. *Motivation for the Tone Change: Internal.* The motivation for the development of a 3rd tone must be either language internal or language external. The evidence for Suma suggests that it was language internal. The phonetic evidence from Gbanu, given above, that there is a conditioned allophonic M in at least one of the 2-tone languages points to a language internal motivation. Moreover, the regularity of the tonal change, affecting as it does all of the *LH tone patterns in the core vocabulary, is strong evidence of internal motivation. If regularity of sound change shows the genetic relationship between languages, it also demonstrates the developmental relationship between a protolanguage and its descendant. Such a relationship is internally motivated. Although regularity of tone change is not as firmly established as the regularity of segmental change, the same principle can be applied to both. There's no reason to believe that this principle means something different for tones than for segments.

Not only is there evidence for language internal motivation, but there is evidence that tends to support the hypothesis that the internal motivation can be more specifically attributed to an overload of the tone system. In the Gbaya languages, tones are used both lexically and grammatically to convey information within a linguistic system characterized by one and two syllable words and few affixes. The potential of an expanded tonal inventory to relieve such an overload can be illustrated by the case of the associative construction.

The associative construction affects only nouns in Suma but it apparently affects the relationship between verbs and objects as well as other parts of speech in other Gbaya languages. The focus here will be on nouns.

In a 2-tone system, such as Gbeya, tones on nouns alternate in the associative construction for all tone patterns except H. A raising effect is observed whereby HL is realized as H; L is realized as H or LH, depending on the number of mora. Furthermore, LH is realized as L. Such alternations depend on the presence not only of the associative morpheme but also on the presence of the correct tonal environment. In Suma, there are many more lexical tone patterns and a smaller percentage of them alternate. To recapitulate, a HL pattern is realized as H and a L pattern is realized as M. The H, LM, HM and MH patterns do not alternate. Thus, in the 2-tone systems, 75% of the tone patterns alternate, while in Suma only 25% do.

(23) Tone Alternations of Nouns in the Associative Construction

2 tone systems:

H = H
HL → H
L → H, LH
LH → L

Suma:

H = H	M = M
HL → H	LM = LM
L → M	HM = HM
LH = LH	MH = MH

It should be clear that the expanded tonal inventory of Suma allows less possibility of overlap or confusion between different nouns. This can be illustrated by minimal pairs in the 2-tone Gbeya language that are neutralized in the associative construction.

(24) Minimal Tone Pairs from Gbeya (Samarin, 1966)

nú 'mouth'	gó 'when (conn.)'	fúk 'meadow'
nù 'ground'	gò 'stony area'	fùk 'flour'
kóy 'squirrel'	kútú 'ctn. tree'	bóró 'lower spine'
kòy 'handle'	kùtù 'temporary hut'	bòró 'hole in a tree'

The contrasts between these pairs are neutralized when the tones on the relevant nouns alternate in the associative construction in Gbeya. The same minimal pairs, when they occur in the 3-tone Suma language are not usually neutralized. That is, the nouns with a lexical H tone pattern do not seem to have HL counterparts which would be expected to alternate with a H pattern. Some nouns, which contrast a L tone pattern with a M tone pattern, are neutralized in Suma, as is shown with *kùtù* 'scabies of dogs and goats' vs. *kūtū* 'fog'. Such nouns are rare.

It should be noted that, at least for the examples given, those not neutralized by Suma are very commonly used. Those that are neutralized, that is, 'fog' and 'scabies of dogs and goats', occur less frequently and are unlikely to promote confusion.

(25)	Gbeya	Suma
	nù → nú	nù → nū
	fùk → fúk	fùk → fūk
	kòy → kóy	kòy → kōy
	gò → gó	gò → gō
	bórò → bóró	
	kútù → kútú	kútù → kūtū

If 3-tone Gbaya languages such as Suma respond to internal pressure from tonal overload by expanding their tonal inventory, how do the 2-tone languages cope? Although the details are beyond the scope of this paper, there is a general difference between the 3-tone and 2-tone Gbaya languages in the associative construction. In the 3-tone languages, the tone alternations occur on nouns with the appropriate tone pattern whenever the associative construction is used. In the 2-tone languages, the tone alternations depend on the presence of a following L tone. Thus, in the 2-tone languages, the tone alternations occur less frequently. It is not clear whether the change in the conditions on a rule of tonal alternation in the associative construction preceded or followed the change in tone inventory; but it is clear that a balance was achieved in 2 different ways depending on whether the tone system included 2 or 3 phonological tones.

9. *Motivation for Tone Change: External.* An alternative explanation for the development of the 3rd tone is that it was externally motivated, namely, the result of borrowing or some other kind of language contact. Borrowing was possible due to the presence of other 3-tone languages in the same general area as Suma. The Suma-speaking area is bordered by a Mbum area, a Gbeya area and a Sara area. Nearby are Banda-speaking areas. The Mbum languages and Gbeya are 2-tone systems, while the Sara languages and Banda are 3-tone systems. Historical contact with 3-tone languages was certainly possible and we cannot rule out the possibility of borrowing.

The mere possibility of borrowing without any positive evidence to support it affords little insight into the historical forces at work in the development of Suma's 3rd tone. Various kinds of evidence would attest to the operation of borrowing. We might expect to find some irregularity in the tone change itself or we might expect irregularity in its distribution such that, for example, the 3rd tone would be found more commonly in peripheral rather than core vocabulary. Instead the tone change is strikingly regular and the core vocabulary seems to exhibit it to the same extent as the peripheral vocabulary. Another kind of evidence, attesting to interdialectal borrowing, might consist of finding unusual items that are common to two dialects but odd in relation to others, and such evidence does exist. However, it points to borrowing between Suma and 2-tone Gbeya, as illustrated in (26). No such evidence has been uncovered for borrowing between Suma and another 3-tone Gbaya language. Clearly, this does not support the hypothesis that the 3rd tone was borrowed.

(26) Interdialectal borrowing:

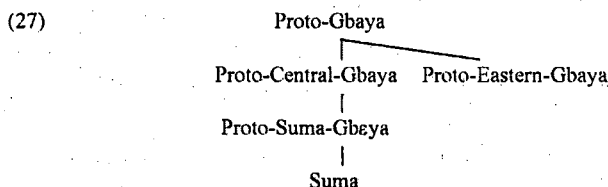
	Suma	Gbeya	Others
death	fey	fey	fio
hunt	yari	yari	gia
tree shrew	langa	langa	kpela

A further kind of evidence that would support a borrowing theory is evidence of some kind of dominance relationship. Although at present, the neighboring Gbeya language enjoys increased prestige in that the prefecture capital is located in a Gbeya-speaking area, there is no reason to believe that such a relationship existed in precolonial times. Furthermore, such a relationship would not support the theory that the 3rd tone was borrowed, since Gbeya is a 2-tone language.

Historical and cultural studies fail to turn up evidence in favor of a dominance relationship that would lead to borrowing. Historical studies (Burnham 1980b, Cordell 1983, 1984) indicate that Suma was not within the domain of any African empires precolonially and that the Suma were not subject to slave-raiding though it occurred to the north and to the west of them. Cultural studies (Burnham 1980a, Richard Bradshaw p.c.) indicate that Suma society is an essentially democratic one in which people vote with their feet. When village people do not like what the village chief is doing, they move away.

There seems to be no evidence of any borrowing from a 3-tone language that would support the notion that the development of a 3rd tone in Suma was the result of borrowing. This lack of evidence, coupled with evidence supporting the theory that the 3rd tone was internally motivated, leads to the conclusion that any explanation of this tonal development would have to depend on internal motivation.

10. *Conclusions.* This paper has demonstrated through the use of segmental and tonal correspondences that the development of a third tone in Suma was independent of the development of a third tone in other Gbaya languages. The genetic relationship of Suma to the other Gbaya languages and to proto-Gbaya can be illustrated as follows:



Motivation for the development of the third tone was internal rather than external. The independent development of a third tone in at least two separate instances in closely related languages lends credence to an explanation for change based on some internal pressure within the larger language group to expand the tonal inventory. Such internal pressure is best explained by the idea that the two tone system was overloaded in terms of the information it was forced to convey.

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